



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,330	12/02/2003	Tetsuya Miyazaki	51214/DBP/T360	3666
23363 7590 05/01/2007 CHRISTIE, PARKER & HALE, LLP PO BOX 7068 PASADENA, CA 91109-7068			EXAMINER KIM, DAVID S	
			ART UNIT 2613	PAPER NUMBER
			MAIL DATE 05/01/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/726,330

Applicant(s)

MIYAZAKI, TETSUYA

Examiner

David S. Kim

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2007.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 5-11 and 16-22 is/are allowed.
6) ☒ Claim(s) 1-4 and 12-15 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 06 February 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Applicant's response to the objection to the drawings in the previous Office Action (mailed on 29 November 2006) is noted and appreciated. Applicant responded by amending the drawings. The replacement drawings were received on 29 November 2006. These drawings are approved. Accordingly, the previous objection is presently withdrawn.

Specification

2. Applicant's response to the objection to the specification in the previous Office Action (mailed on 29 November 2006) is noted and appreciated. Applicant responded by amending the specification. Applicant's amendments overcome the previous objection. Accordingly, the previous objection is presently withdrawn.

Claim Objections

3. Applicant's response to the objection to the claims in the previous Office Action (mailed on 29 November 2006) is noted and appreciated. Applicant responded by amending the claims. Applicant's amendments overcome the previous objection. Accordingly, the previous objection is presently withdrawn. However, Applicant's amendment introduces another claim objection.

4. **Claim 5** is objected to because of the following informalities:

In claim 5, under the "controller" limitation, "increase of the optical and to control" is used where -- increase autocorrelation of the optical autocorrelator and to control -- may be intended.

Appropriate correction is required.

Claim Warning

5. Applicant's response to the claim warning in the previous Office Action (mailed on 29 November 2006) is noted and appreciated. Applicant responded by amending the claims. Applicant's amendments overcome the previous warning. Accordingly, the previous warning is presently withdrawn.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2613

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Ranalli

7. **Claim 12** is rejected under 35 U.S.C. 102(b) as being anticipated by Ranalli (WO 01/93465 A1).

Regarding claim 12, Ranalli discloses:

A method for controlling a dispersion compensator, the method comprising:

autocorrelating an output signal light from the dispersion compensator (Fig. 1, autocorrelation of signal light 40 from compensator 20);

generating a control signal from autocorrelating the output signal light (signal 42); and

controlling the dispersion compensator by the control signal to increase the autocorrelation (Fig. 3A).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Madsen as primary reference

9. **Claims 1 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Madsen ("Integrated waveguide allpass filter tunable dispersion compensators") in view of Wielandy et al. ("Real-time measurement of accumulated chromatic dispersion for automatic dispersion compensation", hereinafter "Wielandy") and Ranalli.

Regarding claim 1, Madsen discloses:

An optical receiver comprising:

Art Unit: 2613

a dispersion compensator (e.g., Fig. 1) having variable dispersion compensation to compensate chromatic dispersion (note the chromatic dispersion dimensions of “ps/nm” in Fig. 1) of a signal light input from an optical transmission line (p. 131, col. 3, “100 km span of SSF” in last full paragraph).

Madsen does not expressly disclose:

an autocorrelator to autocorrelate a signal light output from the dispersion compensator and output a control signal; and

a controller to input the control signal output by the autocorrelator and control the dispersion compensator to increase the autocorrelation of the optical autocorrelator.

However, it is well known to employ a variable dispersion compensator in an apparatus that automatically controls the variable dispersion compensator, as exemplified by Wielandy (Fig. 2). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ a control method to control the variable dispersion compensator of Madsen. One of ordinary skill in the art would have been motivated to do this to accommodate environment-induced changes in the chromatic dispersion of transmission fiber and to accommodate dynamic changes in path dispersion that occur in reconfigurable networks (Wielandy, p. 1198, col. 1, Introduction).

Moreover, the components of an autocorrelator and a controller in a variable dispersion compensation apparatus are known in the art, as shown by Ranalli (Figs. 1-2). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ a similar control configuration for an automatic variable dispersion compensation apparatus that employs the variable dispersion compensator of Madsen. One of ordinary skill in the art would have been motivated to do this to provide a suitable figure of merit for determining the cleanliness of a compensated signal (Ranalli, p. 13, l. 9-16). That is, in an automatic variable dispersion compensation apparatus, one would expect some kind of control loop with a particular figure of merit, e.g., the control loop in Fig. 2 of Wielandy with the figures of merit of the magnitude and sign of measured dispersion (Wielandy, p. 1198, col. 1-2, bridging paragraph). Obvious variations would include other suitable figures of merit. Ranalli teaches that the

Art Unit: 2613

autocorrelation is a suitable figure of merit for compensating pulse broadening (Ranalli, p. 13, l. 9-13). Since pulse broadening results from dispersion, including chromatic dispersion and polarization mode dispersion, one could reasonably expect autocorrelation to be a suitable figure of merit for chromatic dispersion as well as polarization mode dispersion. Such expectation is also suggested by the increased autocorrelation of a signal that has been treated with chromatic dispersion compensation (Wielandy, Fig. 4).

Regarding claim 12, claim 12 is a method claim that introduces limitations that correspond to the limitations introduced by apparatus claim 1. Therefore, the recited means in apparatus claim 1 read on the corresponding steps in method claim 12.

10. **Claims 2-3 and 13-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Madsen in view of Wielandy and Ranalli, as applied to the claims above, further in view of Adams et al. (U.S. Patent No. 6,889,347 B1, hereinafter "Adams").

Regarding claim 2, Madsen in view of Wielandy and Ranalli does not expressly disclose:

The optical receiver of claim 1 further comprising a transmission error rate information calculator to calculate information indicating a transmission error rate of the optical transmission line out of the signal light output from the dispersion compensator, wherein the controller controls the dispersion compensator to decrease the transmission error rate.

However, such a transmission error rate information calculator is known in the art, as shown by Adams (e.g., Fig. 3, raw BER monitor 300 and control circuitry for the compensator, col. 4, l. 28-47). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate these transmission error rate information calculator teachings in the apparatus of Madsen in view of Wielandy and Ranalli. One of ordinary skill in the art would have been motivated to do this to provide an additional/alternative means for controlling dispersion compensation in the case that the control means of Adams employs an indirect indicator of the proper setting for a dispersion compensator (Adams, follow the example of col. 2, l. 46-53)

Regarding claim 3, Madsen in view of Wielandy, Ranalli, and Adams discloses:

Art Unit: 2613

The optical receiver of claim 2 wherein the controller controls the dispersion compensator to increase the autocorrelation of the optical autocorrelator (Wielandy, Fig. 4).

Madsen in view of Wielandy, Ranalli, and Adams does not expressly disclose:

wherein the controller **then** controls the dispersion compensator to decrease the transmission error rate according to output from the transmission error rate information calculator (emphasis Examiner's).

However, notice that the apparatus of Madsen in view of Wielandy, Ranalli, and Adams already incorporates the transmission error rate information calculator. If one were to employ it at some time, one could obviously do so before, during, or after the controller controls the dispersion compensator to increase the autocorrelation of the optical autocorrelator. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ the transmission error rate information calculator after the controller controls the dispersion compensator to increase the autocorrelation of the optical autocorrelator. One of ordinary skill in the art would have been motivated to do this in the case the transmission error rate is not minimized after the controller controls the dispersion compensator to increase the autocorrelation of the optical autocorrelator (the teachings of Adams is focused on minimizing the error rate, col. 4, l. 28-47).

Regarding claims 13-14, claims 13 and 14 are method claims that introduce limitations that correspond to the limitations introduced by apparatus claims 2 and 3, respectively. Therefore, the recited means in apparatus claims 2-3 read on the corresponding steps in method claims 13-14.

11. **Claims 4 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Madsen in view of Wielandy, Ranalli, and Adams, as applied to the claims above, and further in view of the admitted prior art (hereinafter the "APA").

Regarding claim 4, Madsen in view of Wielandy, Ranalli, and Adams discloses:

The optical receiver of claim 2 wherein the dispersion compensator comprises a dispersion compensator having variable amount dispersion compensation (Wielandy, TDC-1 in Fig. 2); and wherein the controller controls the amount of dispersion compensation of the dispersion compensator so that the

Art Unit: 2613

autocorrelation of the optical autocorrelator becomes larger (Wielandy, Fig. 4), and controls the dispersion of the dispersion compensator so that the transmission error rate becomes smaller (Adams, col. 4, l. 28-47).

Madsen in view of Wielandy, Ranalli, and Adams does not expressly disclose:

The optical receiver of claim 2 wherein the dispersion compensator comprises a dispersion/***dispersion slope*** compensator having variable amount dispersion compensation ***and variable dispersion slope***; and wherein the controller controls the amount of dispersion compensation of the dispersion/***dispersion slope*** compensator so that the autocorrelation of the optical autocorrelator becomes larger, and controls the ***dispersion slope*** of the dispersion/***dispersion slope*** compensator so that the transmission error rate becomes smaller (emphasis Examiner's).

However, dispersion slope compensators (APA, p. 1, l. 18-29) are known in the art. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to incorporate dispersion slope compensators in the apparatus of Madsen in view of Wielandy, Ranalli, and Adams. One of ordinary skill in the art would have been motivated to do this since it is known that one may have to compensate for dispersion slope in optical transmission systems (APA, p. 1, l. 14-18).

Regarding claim 15, claim 15 is a method claim that introduces limitations that correspond to the limitations introduced by apparatus claim 4. Therefore, the recited means in apparatus claim 4 read on the corresponding steps in method claim 15.

Ranalli as primary reference

12. **Claims 13-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ranalli in view of Adams.

Regarding claims 13-14, notice the treatment of the limitations introduced by claims 13-14 by the application of Adams. Adams is also applied here to address the same limitations under Ranalli.

13. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ranalli in view of Adams, as applied to the claims above, and further in view of the APA.

Art Unit: 2613

Regarding claim 15, notice the treatment of the limitations introduced by claim 15 by the application of the APA. The APA is also applied here to address the same limitations under Ranalli.

Allowable Subject Matter

14. **Claims 5-11 and 16-22** are allowed.

Response to Arguments

15. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments are based on the limitations newly introduced by Applicant's most recent amendment filed on 06 February 2007. The standing rejections now rely on the new application of references to Ranalli, Wielandy, and Madsen to address these newly introduced limitations. Accordingly, Applicant's arguments are moot.

Conclusion

16. The references made of record and not relied upon are considered pertinent to applicant's disclosure. Aronson et al. (e.g., Fig. 23) and Lenosky (Fig. 2) are cited to show the use of autocorrelation to control a compensator to reduce dispersion (Aronson et al., paragraph [0089]; Lenosky, e.g., claim 8).

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

Art Unit: 2613

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSK


KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER